

Explanation of Experiments and Need for FCC Experimental License

AeroVironment, Inc. (AV) designs, develops, manufactures, supports and operates unmanned aircraft systems (“UAS”) and related services. As part of the engineering and production process AV tests the UAS communications systems to make sure customer specifications are met and to learn how it can better serve its customers. The experimental operations are for testing UAS command and control, telemetry and payload systems. AV proposes a two-year experimental license.

The experiments will conduct Acceptance Test Procedures (ATP) in the 2 GHz spectrum segment addressing uplink command and control and downlink video and telemetry transmissions. These tests relate to AV’s Puma model. The systems are tested and retested as part of the production process. Missions tested include aerial reconnaissance, surveillance, route clearance, mapping, and payload delivery.

The proposed tests relate to UAS performance in a maritime environment and will take place within a confined area of the Santa Barbara Channel, Santa Barbara County, CA. AV engineering and technical personnel will be present. As in any experimental testing, AV gathers feedback regarding the aircraft’s radio communications to assist research and development efforts to improve solutions based on evolving customer need.

Purpose and Nature of Operations

Proposed channels 2362 MHz, 2366, MHz 2389 MHz and 2390 MHz will send command and control data from the UAS and transmit NTSC video and telemetry to the ground control station with modulation SO-QPSK. Emission Designators 4M70G7W and 1M60G7W, with an output transmit power of 2 w, are proposed. Transmission control will be from a ground control station located on a ship or boat to the UAS via a laptop, tablet or consul.

Operations will be within 9 km of the center point, flights will not to exceed 121.9 meters AGL. Not more than one UAS will be airborne at any one time. Testing will be performed at intermittent intervals for several hours daily.

The purpose of the experiments is providing analysis and information in a maritime environment. The Santa Barbara Channel, located in the Pacific Ocean, south of Santa Barbara, presents broad ocean variations for these sea trials. How meteorological and physical elements in an ocean environment affect radio wave propagation is challenging and varies significantly depending on the spectrum segment. How varied elements impact propagation loss, particularly since the antenna height in the UAS varies above the water, will be analyzed. The tests will examine the ability of the video technology to discern variations and changes over short and longer time increments. The tests will also evaluate how the UAS sensors and transmitted video can discern the breadth, direction and degree of wildlife, ecological material and infrastructure in the channel. The tests will gage how effectively the information can be integrated into real time

mapping tools.

Transmitting and Receiver Equipment

Manufacturer	Model	Quantity	Experimental
AeroVironment	66436 ASSY	2	No

Antenna

The following details the antenna information:

Antenna Frequency Segment	Gain (Main Beam)	Polarization	Orientation in Vertical Plane	Orientation in Horizontal Plane
AeroVironment Dual Patch Array	9 dBi*	Vertical	15°	120°
Tailboom AeroVironment Dipole	4 dBi	Vertical	45°	360°

*1st Major Side Lobe
E-Plane N/A

Restrictions on Operations and Interference Protection

AV understands that experimental operations must not cause harmful interference to authorized facilities. AV commits to operations respecting other users of the band and those in adjacent segments. The limited power levels proposed and the short-term intermittent use are part of this commitment. Should any interference occur, AeroVironment will take immediate steps to resolve the interference, including, discontinuing operations.

Waiver of Station Identification Requirements

AV requests a waiver of the station identification requirements stated in Section 5.115 of the Commission's rules.

Stop Buzzer

Bart Decker, AV's Director of Flight Standards, is available by telephone or electronic mail at 805 391-1335 and Decker@AVINC.com, respectively and will act as a stop buzzer if any matters involving interference arise during the testing.

Coordination

This application includes coordination with the Aerospace & Flight Test Radio Coordinating Council (AFTRCC), which is attached. AV agrees to abide by the conditions stated by AFTRCC in its coordination.

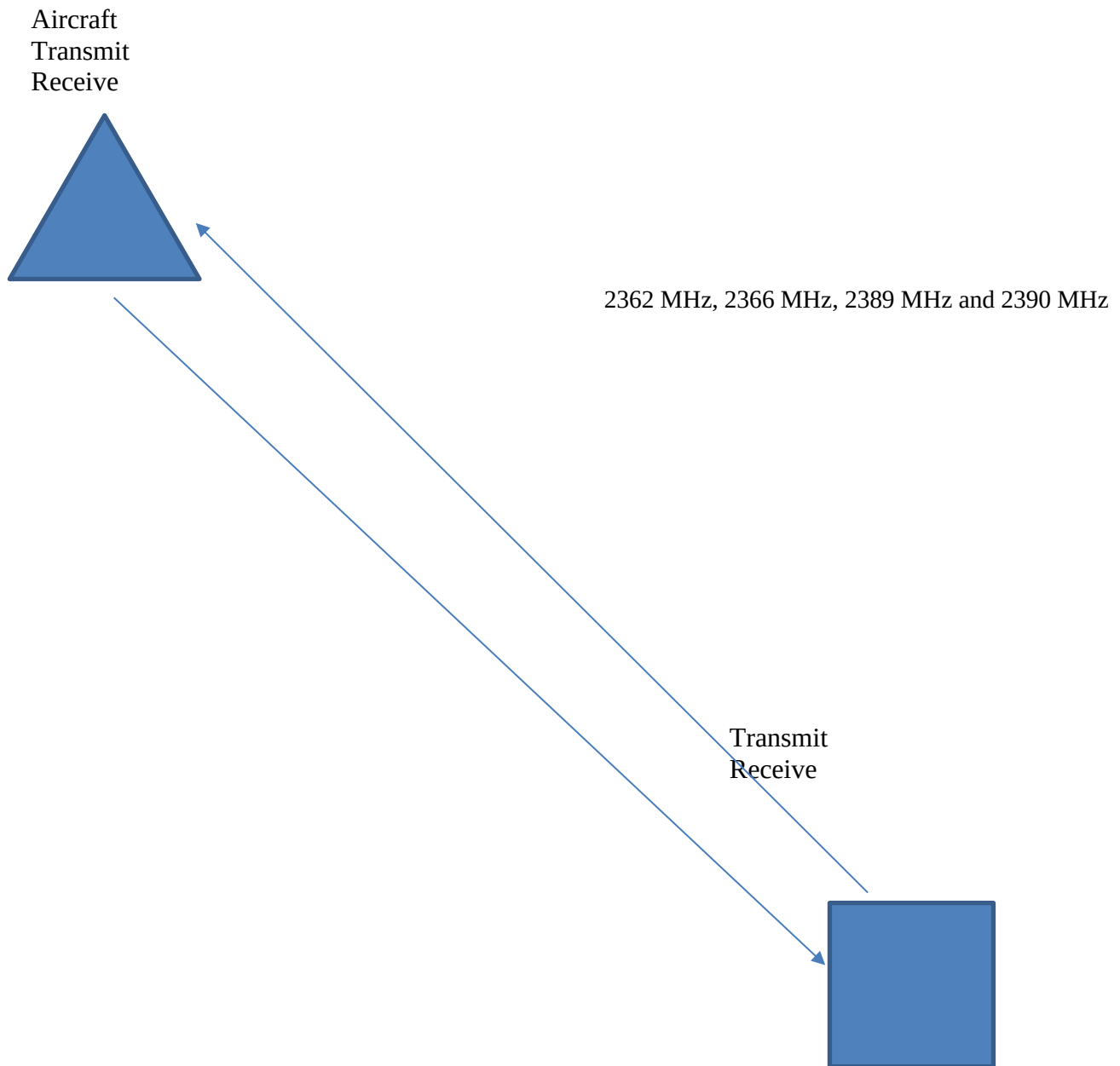
Diagram

A diagram and photographs of the proposed operations and follows.

Conclusion

AeroVironment appreciates the Commission's, NTIA's, the Department of the Defense's, AFTRCC's and other agencies' consideration in reviewing this Experimental Authorization application. Please call upon us if we can respond to any questions.

LINE DIAGRAM



Operations Photographs



Launch



In flight